ARKANSAS *CAREX* (CYPERACEAE): A BRIEFLY ANNOTATED LIST

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ABSTRACT

Recent collections and herbarium specimen study resulted in this review of the status of the 121 taxa in the genus *Carex* occurring the state of Arkansas, USA. A list of these taxa provides frequency and habitat data, while county dot maps show known distribution. The list gives additional information on selected taxa, especially on rare species, on taxa previously considered rare in Arkansas, or on nine taxa reported new to Arkansas. This paper considers several taxa as distinct which were previously treated as synonyms by other authors. It reports four hybrids, and treats taxa excluded from the Arkansas flora, as well as taxa considered to be possible additions to the state flora.

RESUMEN

Recientes recolecciones estudios de especímenes de herbario dieron como resultado esta revisión del estatus de los 121 taxa del género *Carex* del estado de Arkansas, USA. Una lista de estos taxa ofrece datos de frecuencia y hábitat, mientras que los mapas de condados muestran la distribución conocida. La lista da información adicional de taxa selectos, especialmente de especies raras, de taxa considerados raros previamente en Arkansas, o de los nueve taxa citados como nuevos para Arkansas. Este trabajo considera como distintos varios taxa que habían sido tratados como sinónimos por otros autores. Se citan cuatro híbridos, y se tratan taxa excluidos de la flora de Arkansas, así como taxa considerados como posibles adiciones a la flora del estado.

INTRODUCTION

Smith published county record dot maps for 2,469 taxa of vascular plants (1988), and keys to Arkansas' vascular flora (1994). In May 1991, the author set a goal of publishing a book on Arkansas *Carex* in 2011 and began field work toward that end. This paper presents initial results of that study through the 1996 field season. The author's collections, a review of literature, and a review of collections at several herbaria provide the bases for this study.

METHODS

Field work in the last seven years resulted in 1523 Arkansas *Carex* collections, excluding duplicates. 1794 herbarium collections were reviewed [ACPR had 178 collections, CLEM 18, LSU 24, LSUS 3, LTU 46, MO

149*, MOR 8, NA 88, NLU 652, NO 28, SFRP 21, STAR 147, UAM 113, UARK 237*, UNCC 0, USCH 14, WCUH 1, Buffalo National River herbarium 58, Sylamore Ranger District/Experimental Forest herbarium (Ozark National Forest) 9]. An asterisk (*) indicates incomplete reviews. Anthony A. Reznicek reviewed and provided reports of 483 additional Arkansas *Carex* collections at MICH, excluding Hyatt collections. Several factors make the declaration of state records difficult. Consultation with Reznicek resulted in the recognition of many taxa not formerly recognized as distinct by some authors. Some species pairs previously lumped and now split are not treated herein as state records. Declaring state records draws attention to both species new to Arkansas and to species with vouchers which may have been lying unreported in herbaria.

ECOLOGICAL UNITS OF ARKANSAS

Keys, et al. (1995) provides the basis for a map of the ecological regions of Arkansas (Fig. 1). Keys' map and accompanying booklet describe ecological units for the eastern United States, defined as part of the Humid Temperate Domain. Within Arkansas, the Subtropical and Hot Continental Divisions of the Domain occur, with the Ozark Highlands and Boston Mountain Sections represented in the latter, and several sections represented in the former Division. A brief description of the ecologically defined Sections represented in Arkansas, and mapped in Figure 1, based, in part, on Keys' text follows. The figure also shows Crowley's Ridge, a significant subsection. Two letter abbreviations used in Figure 1 precede each section's description.

AV—The Arkansas Valley Section contains the Arkansas River in western Arkansas, and unique Mount Magazine, the highest peak in the state. The sandy and alluvial soils of the valley contrast with the sandstone and shale of the Mountain. White Oak, Northern Red Oak, and hickories dominate the hills which hide a few small wetlands and many perennial streams.

BM—The Boston Mountains, made of high hills and low mountains, lay over sandstones. Southern Red, White, Northern Red, and Post Oaks share the hillsides with various hickories, the hills cut by perennial streams.

CP—Often referred to as the West Gulf Coastal Plain, the Middle Coastal Plains, Western Section (as labeled by Keys et. al. 1995), forms smooth to irregular plains and riverine valleys on various mixtures of sands, silts, clays, and gravels. Shortleaf and Loblolly pines mix with a variety of oaks and hickories, with other wetland species along the frequent streams and rivers.

CR—The subsection known as Crowley's Ridge, an isolated low ridge of Pleistocene loess, nearly bisects the Mississippi Alluvial Basin. Various oaks as well as Beech-Maple forest thrive on this narrow strip of rolling hills surrounded by flatlands. Short stream channels drain the ridge.

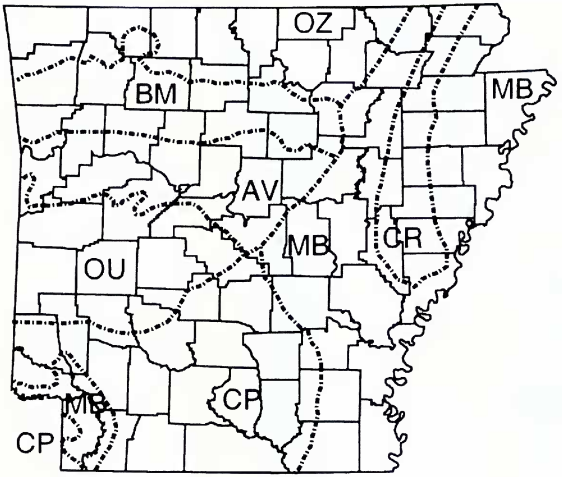


Fig. 1. Ecological units of Arkansas (modified from U.S.D.A. Forest Service, 1995).

MB—The fertile farms of the Mississippi Alluvial Basin Section lie in an area which once held much of Arkansas' wetlands. Earthquakes infrequently rock northeastern sections near the New Madrid fault, causing liquefaction of the alluvial sands, silts, and clays which cover this section. Forests vary from more upland species such as oaks and hickories, to those associated with wetter sites to riverine wetlands, including Loblolly Pine, Sweetgum, hickories, Willow and other oaks, Sycamore, and Birch. Drainage ditches reduced wetlands, although many wetlands remain.

OU—The Ouachita Mountains, unlike the eroded plain of the Ozarks, fold into open high hills and low mountains, on sandstone, shales, and cherts, often with bouldery characteristics. Shortleaf Pine and a mixture of the above oak species cover the hills, with streams often following the east-west lie of the mountains.

OZ—The low hills, irregular plains, karst, and entrenched valleys of the Ozark Highlands contain cherty clay residuum on dolomites, limestones,

and sandstones. Vegetation includes various Oak forests, including White, Post, Blackjack, and Black Oak, with prairie potential in Bluestem and other grasses. Entrenched streams and cool springs provide a haven for northern carices reaching the southern edge of their range.

ARKANSAS *CAREX* (CYPERACEAE): A BRIEFLY ANNOTATED LIST

The following alphabetical list provides a snapshot of current knowledge on the 121 *Carex* taxa recognized in Arkansas. Taxonomy follows the draft of the Flora of North America *Carex* treatment, provided by A.A. Reznicek of MICH (ined.). The general format for entries follows:

Accepted **genus species** (in bold); author(s); figure number (distribution mapped); *synonyms* (in italics); frequency, habitat, comments. An asterisk indicates new state records; voucher specimens cited in some cases.

Frequency statements, unless qualified, represent observed frequency in Arkansas. Arkansas habitats listed include data drawn from personal observations, herbarium labels, consultation with others, or in rare cases, the literature.

The author's collections skew the distributions of some species; Baxter County, the author's home for several years, is both the most heavily collected and has the most known species. North Central Arkansas is better represented than most other regions. Recent collections in south Arkansas, nearest the author's current home, make it better represented than eastern Arkansas, a neglected area. For example, *Carex umbellata* turned up in 28 new western Arkansas counties on a single trip in 1996, while eastern Arkansas has known records primarily from the author's recent collections.

Arkansas distribution maps have two shades, solid for counties where the author confirmed the identification of a specimen, cross-hatched when reported elsewhere without the author's confirmation of the identification. Most of the identifications of the author's collections were confirmed or corrected by A.A. Reznicek, while most herbarium specimens (with the exception of those at MICH) were not.

C. abscondita Mack.—(Fig. 2). Locally numerous, in dense colonies; restricted to floodplains in moist deciduous woods (prefers natural levees). See Naczi and Bryson (1990).

***C. aggregata** Mack.—(Fig. 2). Rare, moist opening in a disturbed creek bottom forest, and also an adjacent pasture (formerly forest) and hedgerow by road next to the pasture (*S. & G. Jones, A. & S. Reznicek 11140* BRCH, MICH, TRTE, VDB); Benton Co. *Bailey & Gibbons s.n.* (UARK) from May 28, 1975 was determined as *C. aggregata* by Stanley D. Jones (E.B. Smith, pers. comm.).

***C. alata** Torr. & A. Gray.—(Fig. 2). A record of this plant (*D. Castaner 9119* at WIS) from Crowley's Ridge State Park area, collected May 10, 1986 was pointed out by Anthony A. Reznicek. This plant, probably scattered in northern Arkansas, also occurs in Missouri within four miles of Fulton County, Arkansas.

C. albicans Willd. var. **albicans**.—(Fig. 2). *Carex artitecta* Mack., *C. emmonsii* Dew. ex Torr. var. *muhlenbergii* (A. Gray) Rettig, *C. physorhyncha* Liebm. Occasional, widespread; bluffs, hillsides.

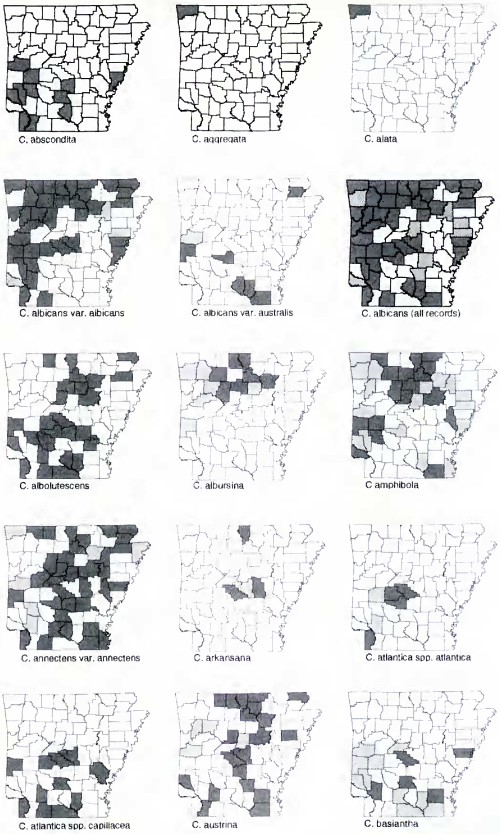


FIG. 2. Documented county records in Arkansas for *Carex* species (**solid** = counties where the author confirmed the identification, and **cross-hatched** = when reported elsewhere without the author's confirmation).

C. **albicans** Willd. var. **australis** (L.H. Bailey) Rettig.—(Fig. 2). *Carex emmonsii* Dew. ex Torrey var. *australis* (L.H. Bailey) Rettig, *C. physorhyncha* Liebm. Infrequent, poorly known in state. See Orzell and Bridges (1987).

C. **albolutescens** Schwein.—(Fig. 2). Occasional to common south, infrequent northwest; floodplains, wet woods.

C. **albursina** Sheldon.—(Fig. 2). Taxonomy of Arkansas material needs study; locally abundant, deep valleys, mesic north-facing slopes.

C. **amphibola** Steud. sensu lato—(Fig. 2). Common northwest, occasional elsewhere; valleys, floodplains.

C. **annectens** Bickn. var. **annectens.**—(Fig. 2). Common (several more counties represented at UARK per E.B. Smith, pers. comm. 1994), ruderal.

C. **arkansana** L.H. Bailey.—(Fig. 2). Infrequent to rare; prairies, surrounding ruderal areas (*Hyatt 4623.03, 4829.03* MICH, UARK).

C. **atlantica** L.H. Bailey subsp. **atlantica.**—(Fig. 2). Infrequent; streamsides in bog-like areas, sometimes with *Sphagnum* mosses. Poorly studied in Arkansas *(Orzell 1783* MICH).

C. **atlantica** L.H. Bailey subsp. **capillacea** (L.H. Bailey) Reznicek.—(Fig. 2). Locally abundant; bog-like streamside floodplain (*Orzell 1321* MICH).

C. **austrina** (Small) Mack.—(Fig. 2). Occasional to common north, infrequent south; roadsides, prairies.

*C. **basiantha** Schk.—(Fig. 2). Occasional, locally abundant; floodplains, forms large colonies along larger streams. Infrequent in the Ozarks, where *C. jamesii* largely replaces it (*Orzell 1733* MICH). Considered distinct from *C. willdenowii*. Naczi et al. (1998) discussed the recognition of this species.

C. **bicknellii** Britt. var. **opaca** F.J. Herm.—(Fig. 3). Infrequent; prairie regions and remnants. See Jones and Reznicek (1991) for a key to Texas *Ovales*, and Herman (1972).

C. **blanda** Dew.—(Fig. 3). *Carex laxiflora* Lam. var. *blanda* (Dew.) Boott. Common to abundant, widespread; mesic woodlands, ruderal.

C. **brevior** (Dew.) Mack. ex Lunell.—(Fig. 3). Occasional; ruderal, natural habitats poorly known in Arkansas.

C. **bromoides** Schk. var. **bromoides.**—(Fig. 3). Rare, cherty soil, full shade (Rettig 1982); probably from swampy areas.

C. **bulbostylis** Mack.—(Fig. 3). Infrequent to occasional, poorly known; "mesic sandy ravine forest with some calcareous influence" (Orzell & Bridges 1987), floodplain forests.

C. **bullata** Schk.—(Fig. 3). Rare; wet areas on sandy soil, roadside, open or wooded. Known in Arkansas from two collections (*Moore 400396*, and *Bryson 5775;* UARK). These represent the only known sites west of the Mississippi River (A.A. Reznicek, pers. comm.). Lipscomb (1980) cites *Moore 480070* WIS, from Logan County.

C. **bushii** Mack.—(Fig. 3). Occasional, locally common; prairies, glades.

C. **careyana** Torr.—(Fig. 3). Infrequent, very locally abundant; deep mesic valleys on talus slopes often below bluffs (*Hyatt 5891* MICH).

C. **caroliniana** Schwein.—(Fig. 3). Occasional north, common south; ditches, sunny valleys.

C. **cephalophora** Muhl. ex Willd.—(Fig. 3). Common, widespread; woodlands.

C. **cherokeensis** Schwein.—(Fig. 3). Common, widespread; floodplains, often of smaller streams, ditches, old fields, wet woods, swamps.

C. **communis** L.H. Bailey.—(Fig. 3). Occasional, locally abundant; blufflines, especially below bluffs on upper talus slopes.

C. **comosa** Boott.—(Fig. 3). Infrequent; borders of larger streams, small lakes.

C. **complanata** Torr. & Hook.—(Fig. 3). *Carex complanata* Torr. and Hook. var. *complanata* Infrequent north, common to abundant elsewhere; ditches, pine woods, often ruderal.

C. **conjuncta** Boott.—(Fig. 3). Rare; open wooded pasture, wet area (*Reznicek 9792* MICH,

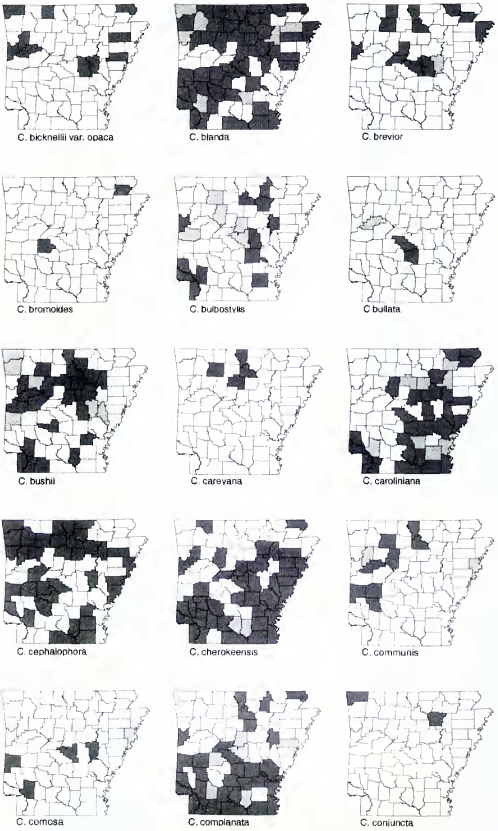


FIG. 3. Documented county records in Arkansas for *Carex* species (**solid** = counties where the author confirmed the identification, and **cross-hatched** = when reported elsewhere without the author's confirmation).

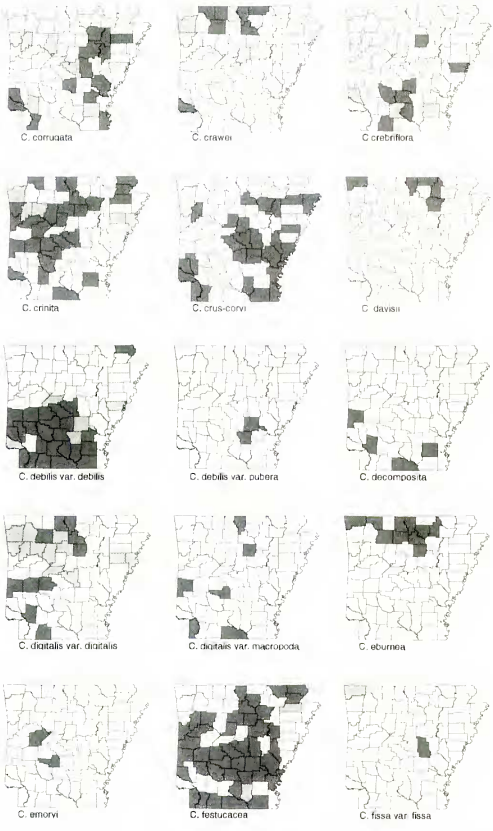
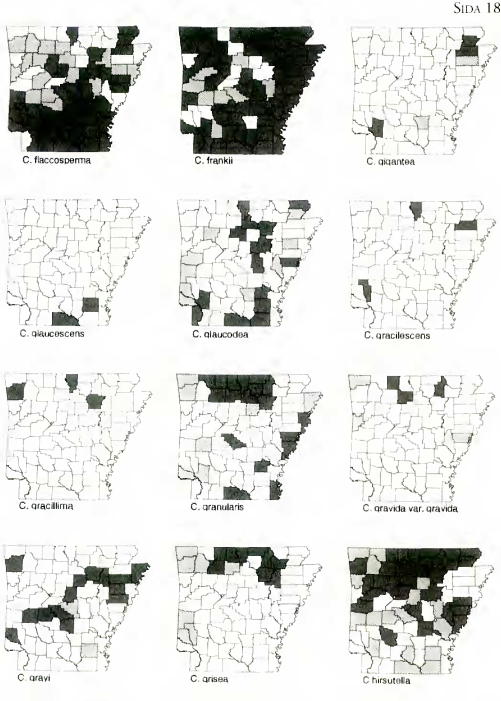


FIG. 4. Documented county records in Arkansas for *Carex* species (**solid** = counties where the author confirmed the identification, and **cross-hatched** = when reported elsewhere without the author's confirmation).

UARK). The author has not seen the voucher (Jones & Reznicek 1995).
C. **corrugata** Fern.—(Fig. 4). Locally common; restricted to floodplains of major rivers, streams, low woods.
C. **crawei** Dew.—(Fig. 4). Occasional, very locally abundant; calcareous sunny seeps, springs, glades, most frequent in rights-of-way which cross glades.
C. **crebriflora** Wieg.—(Fig. 4). Occasional to common; local to small drainages, stream floodplains (*Demaree 14415* MICH).
C. **crinata** Lam.—(Fig. 4). Locally common; perennial streambanks, wetlands.
C. **crus-corvi** Shuttlew. ex Kuntze.—(Fig. 4). Occasional, often scattered; wetlands, ruderal wetlands, often roadsides.
C. **davisii** Schwein. & Torr.—(Fig. 4). Locally common, occasional in north Arkansas, especially on the Salem Plateau; calcareous stream floodplains, pastures, woodlands (Hyatt 1994).
C. **debilis** Michx. var. **debilis.**—(Fig. 4). Common to abundant south; sweet bay and magnolia swamps, stream terraces, creekbanks.
C. **debilis** Michx. var. **pubera** A. Gray.—(Fig. 4). Rare; Morrow's Bottoms Natural Area (*Sundell* and *Barnes 9753*, UAM).
C. **decomposita** Muhl.—(Fig. 4). Infrequent, swamp and lake margins (*Moore 490043* UARK).
C. **digitalis** Willd. var. **digitalis.**—(Fig. 4). Common; upland and north-facing deciduous woods.
C. **digitalis** Willd. var. **macropoda** Fern.—(Fig. 4). Infrequent; rich woods and floodplains (*Hyatt, et. al. 5290*, MICH, UARK). Anthony A. Reznicek reports (pers. comm.) a specimen collected by Hasse in Little Rock, May 1886, has vouchers at BH, MICH, and NY.
C. **eburnea** Boott.—(Fig. 4). Occasional; very local herbaceous dominant, calcareous glade outcrops, bluffs at wet microsites.
C. **emoryi** Dew.—(Fig. 4). Rare; streambanks (*Walker, s.n.* UARK).
C. **festucacea** Schk.—(Fig. 4). Common; prairie wetlands, ruderal. Underrepresented in collections.
*C. **fissa** Mack. var. **fissa.**—(Fig. 4). Rare, "Moist, open grassy and sedgey meadow, heavy clay soil (*Reznicek 9271*, MICH). See Jones, et. al. (1990).
C. **flaccosperma** Dew.—(Fig. 5). Common; floodplains, widespread in flatlands.
C. **frankii** Kunth.—(Fig. 5). Abundant; creekbanks, lakeshores, ditches. Arkansas' most widely reported *Carex* sedge.
C. **gigantea** Rudge.—(Fig. 5). Infrequent; riverside (*Demaree 3379*, UARK), lowlands near Crowley's Ridge and common in a backwater swamp (*Orzell 3483* MICH).
C. **glaucescens** Ell.—(Fig. 5). Infrequent; floodplains of smaller streams, swamps (*A.A. Martin s.n.* SFRP).
C. **glaucodea** Tuckerm.—(Fig. 5). Occasional; ruderal, woodlands, frequent in seldom used woods roads.
C. **gracilescens** Steud.—(Fig. 5). Rare; steep rocky slopes above the Cossatot River (*Naczi 1917, 1926*, MICH). Record courtesy of A.A. Reznicek.
C. **gracillima** Schwein.—(Fig. 5). Rare, two very small, local, Ozark populations on moist north facing rock outcrop (Hyatt 1993), mesic deep valley below sandstone bluff at dripping waterfall (*Hyatt 5723*, MICH, UARK).
C. **granularis** Muhl.—(Fig. 5). Locally common to occasional; springs, seeps, ditches.
C. **gravida** L.H. Bailey var. **gravida.**—(Fig. 5). Infrequent; prairies.
C. **grayi** Carey.—(Fig. 5). *Carex gneyii* Carey, an orthographic variant. Occasional; wooded wetlands, ditches.
C. **grisea** Wahl.—(Fig. 5). Occasional; calcareous floodplain woods, less frequent in sur-



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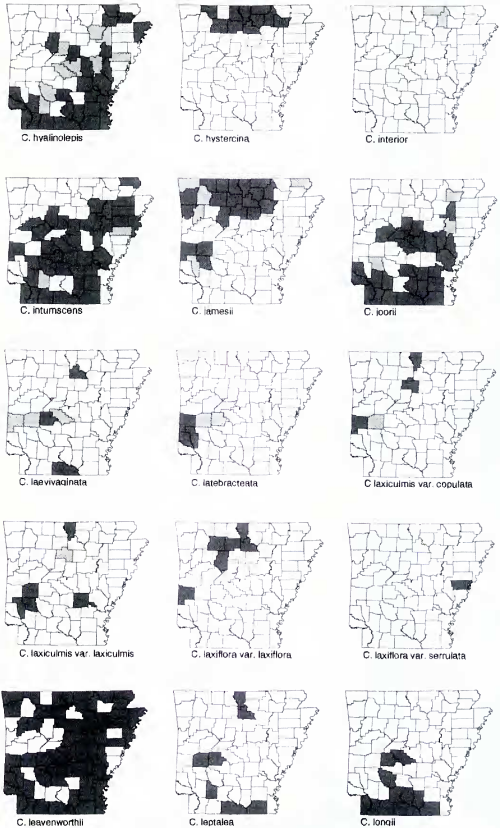

FIG. 6. Documented county records in Arkansas for *Carex* species (**solid** = counties where the author confirmed the identification, and **cross-hatched** = when reported elsewhere without the author's confirmation).

rounding uplands.

C. hirsutella Mack.—(Fig. 5). *Carex complanata* Torr. and Hook. var. *hirsutella* (L.H. Bailey) Gleason. Abundant to common north, occasional to infrequent south; ruderal, very widespread.

C. hirtifolia Mack.—(Fig. 5). Infrequent; mesic valleys and floodplains of small to medium sized streams at many, but localized sites (Thomas et. al. 1991).

C. hitchcockiana Dew.—(Fig. 5). Infrequent; mesic, topographically shaded and protected, cool north facing slopes in deep valleys near larger intermittent streams. Such Ozark streams often have long superficially dry sections with flow under gravel.

C. hyalina Boott.—(Fig. 5). Locally abundant to common, absent outside specialized habitat; prefers shaded deciduous woods often on clay soils, periodically flooded, usually along major rivers and tributaries. Often easily found by looking near bridges on rights-of-way crossing floodplains. See Bryson, et. al. (1992), Reznicek and Naczi (1993), Reznicek and Hyatt (1996).

C. hyalinolepis Steud.—(Fig. 6). Occasional; forming huge colonies with long, stout rhizomes in swamps, ditches, wet prairies.

C. hystericina Muhl. ex Willd.—(Fig. 6). *Carex hystricina* Muhl. ex Willd. an orthographic variant. Occasional, very locally abundant; limestone dominated seeps, springs, and streams. Prefers sunny sites with perennial streams; absent nearly everywhere else; rare at heavily shaded sites.

C. interior L.H. Bailey.—(Fig. 6). Rare; calcareous seeps (Orzell and Bridges 1987; Reznicek and Ball 1980).

C. intumescens Rudge.—(Fig. 6). Common; widespread in wetland woods, wetland edges.

C. jamesii Schwein.—(Fig. 6). Locally abundant; floodplains, especially in deep, narrow valleys.

C. joorii L.H. Bailey.—(Fig. 6). Common to infrequent; wetland woods, swamps, wooded roadsides.

C. laevivaginata (Kukenth.) Mack.—(Fig. 6). Infrequent; swampy meadows, calcareous seeps.

C. latebracteata Waterfall.—(Fig. 6). Infrequent, locally numerous; "well drained dry to dry-mesic slopes" (Orzell & Bridges, 1987).

C. laxiculmis Schwein. var. **copulata** (L.H. Bailey) Mack.—(Fig. 6). Infrequent; mesic north-facing slopes in deep valleys.

C. laxiculmis Schwein. var. **laxiculmis.**—(Fig. 6). Taxonomy of Arkansas varieties needs study, poorly known, but 1997 collections revealed several new sites; infrequent; mesic valleys in deciduous woods.

C. laxiflora Lam. var. **laxiflora.**—(Fig. 6). Arkansas distribution poorly understood, Arkansas material needs taxonomic study; occasional (but varieties in question); mesic woodlands.

C. laxiflora Lam. var. **serrulata** Underwood.—(Fig. 6). Arkansas distribution poorly understood, Arkansas material needs taxonomic study; rare; rich woods.

C. leavenworthii Dew.—(Fig. 6). Common; ruderal.

C. leptalea Wahl.—(Fig. 6). *Carex leptalea* Wahl. var. *leptalea*. Occasional; calcareous seeps in northern Arkansas, wooded seeps at base of slopes in southern Arkansas.

C. longii Mack.—(Fig. 6). Occasional and probably very undercollected, especially in south Arkansas; wet woods. See Rothrock (1991).

C. louisianica L.H. Bailey.—(Fig. 7). Occasional; swamps and low wetland woods. See Reznicek and Ball (1974); Jones and Hatch (1990).

C. lupuliformis Sartwell.—(Fig. 7). Occasional; wetter habitats than and similar habitats to *C. lupulina* (A.A. Reznicek, pers. comm. 1993).

C. lupulina Muhl.—(Fig. 7). Common; wetland woods, prairie edges, swamps, ditches.

C. lurida Wahl.—(Fig. 7). Common; widespread along streams, lakeshores, ditches, swamps.
C. meadii Dew.—(Fig. 7). Occasional; limestone glades, sinks, prairies.
***C. mesochorea** Muhl. ex Willd.—(Fig. 7). Reported here as a state record for Arkansas; rare, ruderal; (*Hyatt 5485, 5494, 5636*, MICH, UARK).
C. microdonta Torr. & Hook.—(Fig. 7). Infrequent; chalk glades (*Moore 400161* UARK), prairie openings, glades. See Lipscomb (1980).
C. molesta Mack.—(Fig. 7). Occasional; floodplains, usually of larger streams "commonly ruderal . . . near or along streams and in open woodland. However it often prefers heavy, claycy soils and is definitely more of a calciphile [than *C. molestiformis*]" (Reznicek & Rothrock 1997).
C. molestiformis Reznicek & Rothrock.—(Fig. 7). Occasional; riverine floodplains, ruderal. Reznicek and Rothrock (1997), in recently describing this species, note it "thrives in a wide variety of open to somewhat shaded, mostly ruderal, habitats with a wide range of associates, including ditches, dryish roadsides, river and streambanks, moist meadows, and open forests . . . . Typically, colonies of *C. molestiformis* rarely occur far from streams . . ." collaborating the author's initial observations. *C. molesta*, while also exhibiting strong ruderal tendencies, occurs more typically in sunny upland spring and stream sites and ruderal settings which imitate these habitats, while *C. molestiformis* is more riverine.
C. muhlenbergii Willd. var. **enervis** Boott.—(Fig. 7). Varieties poorly studied in Arkansas; common species; dry, acid soil woodland/glade complex (Orzell & Bridges 1987).
C. muhlenbergii Willd. var. **muhlenbergii.**—(Fig. 7). Varieties poorly studied in Arkansas; common species; widespread in woodlands, roadsides. The varieties may have once been separate species with separate habitats and little intergrading until recent disturbance confused the issue (S. D. Jones, pers. comm.).
C. muskingumensis Schw.—(Fig. 7). Infrequent; floodplains. Orzell and Bridges (1987) report it in "open areas of a wet-mesic interstream flatwoods."
C. nigromarginata Schw.—(Fig. 7). including the poorly differentiated *C. floridana* Schw. Occasional; widespread in woodlands. This species presents a variety of overlapping growth and color forms, with occasional long rhizomes and pale to heavily purple splotched and dark green leaves. Morphology intergrades, making distinctions difficult.
***C. normalis** Mack.—(Fig. 7). Reported here new to Arkansas. Rare; seepy roadside ditch on acid sandstone, deep valley, deciduous woods, floodplain of the Little Red River of the Ozark region (*Hyatt, et. al. 5275*, MICH, UARK), streamside in Sharp County.
C. oklahomensis Mack.—(Fig. 7). Common; ditches, wetlands.
C. oligocarpa Schk.—(Fig. 8). Common; streambanks, north-facing slopes, deciduous woods.
C. ouachitana Kral, Manhart, & Bryson.—(Fig. 8). Occasional, locally widespread and abundant; "arenaceous oak-hickory-pine uplands" (Kral et al. 1987) and "rocky ridgetop and slope forest throughout much of the Ouachita Mountains" (Orzell and Bridges 1987). See also McNeilus (1992) and Naczi and Bryson (1990).
C. oxylepis Torr. & Hook. var. **oxylepis.**—(Fig. 8). Occasional; rich hardwoods in mountains, swamps and ditches elsewhere.
C. oxylepis Torr. & Hook. var. **pubescens** Underwood.—(Fig. 8). Occasional, locally common; seeps, moist bluffs, floodplains. Rarely reported outside Arkansas.
C. ozarkana Rothrock & Reznicek.—(Fig. 8). Occasional, locally frequent; Rothrock and Reznicek (1996) described this species from the Arkansas hills, Oklahoma Ouachitas, and one Texas location. The author found it at two locations within 30 miles of, and expects it in, extreme north Louisiana. Rothrock and Reznicek (ibid) call it "a species of early succession wetlands on mineral soil . . . . [from] banks of streams and . . . ditches, pond shores, and wet depressions in meadows and pastures."
C. pellita Willd.—(Fig. 8). *Carex lanuginosa* Michx. Rare (*McNalty 321* STAR).

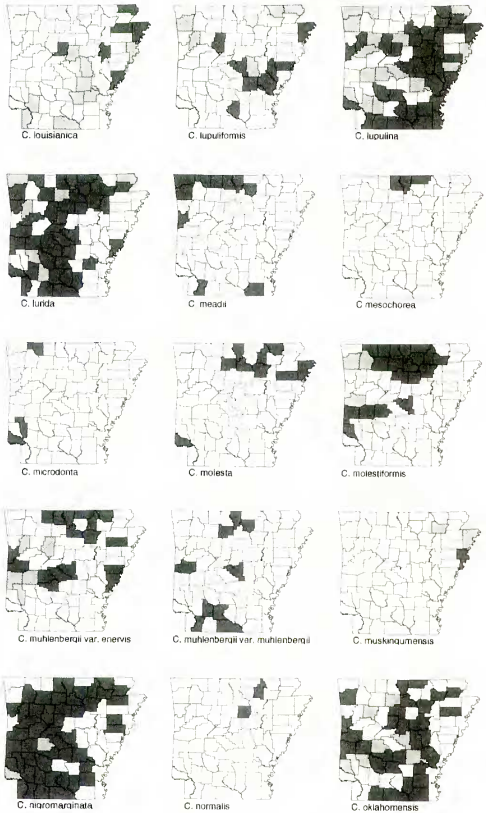

FIG. 7. Documented county records in Arkansas for *Carex* species (**solid** = counties where the author confirmed the identification, and **cross-hatched** = when reported elsewhere without the author's confirmation).

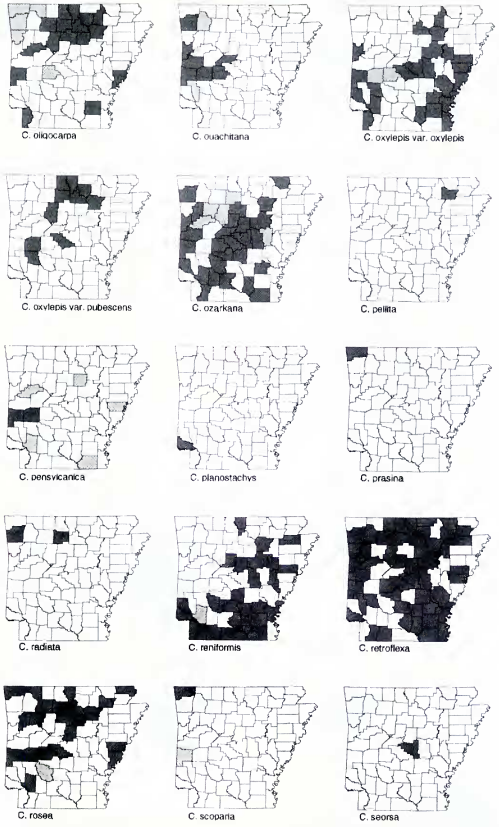

FIG. 8. Documented county records in Arkansas for *Carex* species (**solid** = counties where the author confirmed the identification, and **cross-hatched** = when reported elsewhere without the author's confirmation).

C. pensylvanica Lam.—(Fig. 8). Occasional; benches on north facing slopes in White Oak woods, habitat poorly reviewed.

C. planostachys Kunze.—(Fig. 8). Rare, locally abundant; chalk glade outcrop complex. Northeastern extent of range barely extending into southwest Arkansas in a unique habitat with *Juniperus virginiana* on exposed white chalk outcrop (*Davis* and *Rettig 2840* APCR earliest collection found, April 1, 1981).

C. prasina Wahl.—(Fig. 8). Rare; a single collection (*Demaree 5050* UARK) from May 12, 1928 along War Eagle Creek in northwest Arkansas. "Rare in Mississippi and Missouri" states A.A. Reznicek (pers. comm.) suggesting "Crowley's Ridge is a likely bet, along a woodland seep with *Liriodendron*."

***C. radiata** (Wahl.) Small—(Fig. 8). *Carex rosea* sensu Mack. Reported here as new to Arkansas, rare. *Hyatt 5678* MICH, UARK, peh from the Buffalo National River at T16N,R15W,S4, in moist calcareous woods near Arkansas Highway 14.

C. reniformis (L.H. Bailey) Small.—(Fig. 8). Occasional; floodplains of larger streams, lakeshores.

C. retroflexa Willd.—(Fig. 8). Common; widespread.

C. rosea Schkuhr.—(Fig. 8). *Carex convulata* sensu Mack. See Webber and Ball (1984) for taxonomy and synonymy of *C. radiata*, *C. rosea*, and *C. socialis*; common mountains, infrequent elsewhere; valleys and riparian areas.

***C. scoparia** Schk. ex Willd.—(Fig. 8). Rare; wet, disturbed meadow dominated by *Juncus*, *Carex*, and diverse weedy grasses where it forms frequent large clumps (*Reznicek 9789* MICH). Numerous authors included it Arkansas' flora (Smith 1988).

***C. seorsa** Howe.—(Fig. 8). Rare; "low woods". Historic record only, no reports in this century. A.A. Reznicek (pers. comm. 1995) located a specimen collected by Hasse in 1885 at MICH.

C. shortiana Dew.—(Fig. 9). Infrequent; calcareous sunny wetlands and springs.

C. socialis Mohlenbrock and Schwegmann.—(Fig. 9). Occasional; floodplains of larger rivers in several areas, associated with *C. hyalina* and *C. corrugata*. Some authors have treated this as a synonym of *C. rosea*; habitat and morphology make it distinct (Webber & Ball 1984).

C. sparganioides Muhl..—(Fig. 9). Infrequent, typically local in small colonies of fewer than 20 plants, sometimes 3-4, rarely near 100, with colonies widespread but well scattered; calcareous valleys and floodplains.

C. squarrosa L.—(Fig. 9). Occasional, usually scattered individuals; ditches, floodplain woods.

C. striatula Michx.—(Fig. 9). Locally common; rich wooded slopes on sandy soils. See Naczi and Bryson (1990).

C. stricta Lam.—(Fig. 9). Infrequent; creek gravelbeds.

C. suberecta (Olney) Britt.—(Fig. 9). Infrequent; calciphile at springs, mossy fens, seeps.

C. swanii (Fern.) Mack.—(Fig. 9). Infrequent; sinks, deep valleys, floodplains.

C. texensis L.H. Bailey.—(Fig. 9). Occasional; mountain valleys.

C. torta Boott.—(Fig. 9). Occasional; mountain gravel streams, forming clumps between rocks.

C. triangularis Boeck.—(Fig. 9). Common; ditches.

C. tribuloides Wahl.—(Fig. 9). Common; widespread. See also Reznicek (1993).

C. typhina Michx.—(Fig. 9). Occasional; oak savannah wetlands, ditches, creek terraces, and other wetlands.

C. umbellata Schkuhr.—(Fig. 9), including Arkansas reports of *C. abdita*. Considered Arkansas' most frequent and widespread sedge (third most widely reported), easily overlooked, upland forests, roadsides. In 1992, ranked S1 (6 or fewer known locations in state) by the

Arkansas Natural Heritage Commission; 1996 collections added 28 counties. Now rivaling the frequently collected *C. frankii* and *C. vulpinoidea*. Recommended as the state *Carex* sedge of Arkansas. Fruits often infested by smut. Early blooming species with fruits often harvested by ants; may be an important spring food for ants.

C. virescens Muhl. ex Willd.—(Fig. 9). Two records: historic *Harvey s.n.* UARK, "low woods", July 1884, county unknown; *Rettig 554* UARK, 20MAY1982, Mont. Co., "Red Oak, Sweet Gum overstory."

C. vulpinoidea Michx.—(Fig. 10). Abundant; ruderal and widespread, a wetland species. The second most widely reported Arkansas *Carex* sedge.

C. willdenowii Willd. var. **willdenowii**.—(Fig. 10). Rare; known only from a single location (Iron Springs Recreation Area, Ouachita National Forest) west of the Mississippi River (A.A. Reznicek, pers. comm.). See Orzell and Bridges (1987) and Naczi and Bryson (1990). All other Arkansas "*C. willdenowii*" specimens reviewed should be considered *C. basiantha*.

HYBRIDS

C. albicans var. **albicans** × **C. nigromarginata** punitive hybrid—Determined by A.A. Reznicek (*Hyatt 6907*, MICH); from Woodruff County.

C. flaccosperma × **C. glaucodea** punitive hybrid—Determined by A.A. Reznicek (*Hyatt 6488*, MICH); from Saline County.

C. flaccosperma × **C. granularis** punitive hybrid—Determined by A.A. Reznicek (*Reznicek 9291*, MICH); from Saline County.

C. lurida × **C. lupulina** punitive hybrid—Determined by A.A. Reznicek (*Hyatt 5720*, MICH, UARK); from Lonoke County.

POSSIBLE ADDITIONS

The following taxa, listed as "possible additions" by Smith (1988) have since been confirmed in Arkansas by collections: *C. davisii*, *C. gracilescens*, *C. hyalina* (pre-1988 collections of *C. hyalina* were not represented at UARK), and *C. suberecta*. Possible additions to the flora of Arkansas follow.

C. annectens Bickn. var. **xanthocarpa** (Bicknell) Wiegand.—*Hyatt 4343* (MICH, UARK) was misidentified as this taxon initially. This variety could occur in north Arkansas.

C. buxbaumi Wahl.—Reported for Arkansas by Demaree (1943). Tucker (1987) notes it "reaches its southern limit in . . . Arkansas". Smith (1988) only refers to Tucker (1987) and lists it as a possible addition to the flora of Arkansas (1994). No vouchers found.

C. incomptera Bickn.—Reported for Arkansas by Demaree (1943). No vouchers found.

C. picta Steud.—Possibly rare in southern Arkansas.

C. styloflexa Buckl.—Possibly in "southeast Arkansas in boggy or wet places in hardwoods at the bases of slopes of bluffs" (Reznicek, pers. comm.).

C. tenera Dew.—Possibly rare in northern Arkansas. Unpublished reports by the author based on an immature specimen of *C. normalis*.

C. verrucosa Muhl.—"Listed for Arkansas by Demaree (1943); perhaps rare in south Arkansas" (Smith 1988).

EXCLUDED TAXA

Smith (1988) excluded the following taxa from the flora of Arkansas; I concur; *C. baileyi*, *C. douglasii*, *C. exilis*, *C. flava*, *C. gynandra*, *C. haydenii*,

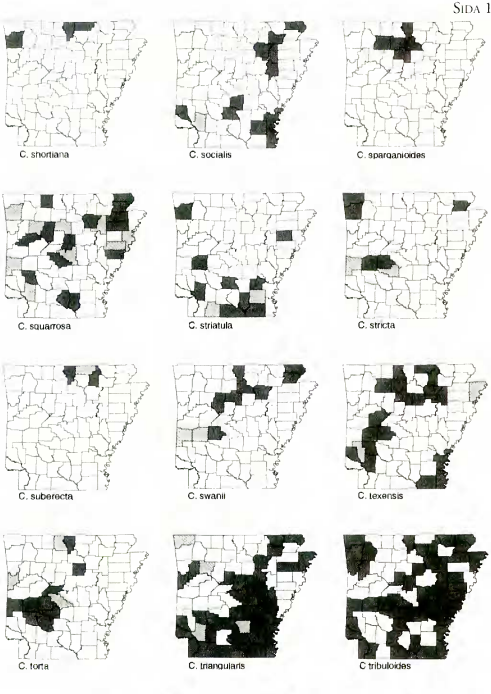

FIG. 9. Documented county records in Arkansas for *Carex* species (**solid** = counties where the author confirmed the identification, and **cross-hatched** = when reported elsewhere without the author's confirmation).

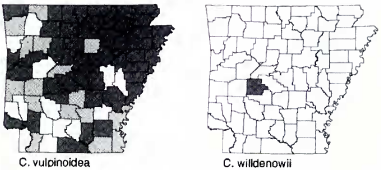

FIG. 10. Documented county records in Arkansas for *Carex* species (**solid** = counties where the author confirmed the identification, and cross-**hatched** = when reported elsewhere without the author's confirmation).

C. lacustris, *C. muricata*, *C. plantaginea*, *C. platyphylla*, *C. sartwellii*, *C. sprengelii*, *C. tetanica*. Two additional taxa, excluded by Smith (ibid), are now known to occur in Arkansas. Additional excluded taxa follow.

C. **backii** Boott.—Reported for Arkansas by Lipscomb (1980) based on immature specimens of *C. latebracteata*. A.A. Reznicek (pers. comm.) has seen the voucher.
C. **straminea** Willd.—Anthony A. Reznicek (pers. comm. 1996) noted the one Missouri location for this is a considerable disjunct, and Oklahoma reports of *C. straminea* are based on the recently named *C. ozarkana*.
C. **tetanica** Schk.—Anthony A. Reznicek (pers. comm. 1993) notes "not in Arkansas, possibly not in Missouri even."

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